

PERFORATED DUODENAL—ULCER REPORT OF AN UNUSUAL CASE.

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Since the first recorded case of successful operation for perforated duodenal ulcer by Dean¹ in 1894, this surgical catastrophe has gradually emerged from a state of diagnostic obscurity until at the present time it must be regarded as one of the foremost and most formidable of the "acute abdominal accidents" with which the surgeon has to deal. There is perhaps no other acute lesion in the upper abdomen in which the clinical findings and historical data permit of a positive diagnosis in so many instances, and surely there is none in which it is more vitally imperative that the surgeon recognize that he is confronted by a grave surgical emergency.

Moynihan's² most exhaustive work on duodenal ulcer so completely covers the entire subject that no attempt will be made in this paper carefully to review the literature, and for such information reference is made to the above named work. However, we feel justified in reporting the following case, not alone on account of the completeness of the record, including diagnosis both before and after rupture, supplemented by operative and autopsy findings; but also, and more especially because of the size of the perforation and the length of time the patient survived the operation, both of which are unusual in surgical records, considering the length of time that had elapsed between perforation and operation:

Case history: Patient referred by Dr. W. W. Crawford. C. E. H., male, 41 years old, commission merchant, Swedish-American.

Present complaint: Patient complains of severe pain in upper abdomen, from which he has been suffering for about 40 hours. He states that the onset was sudden and the pain from the beginning agonizing and most intense, having subsided in severity during the last 12 hours. Soon after the onset he vomited about a cupful of "blood-stained, sticky material," and has felt greatly nauseated since. He is thirsty and feels very weak. Two days prior to the onset of the severe pain he had been ordered to bed by Dr. Crawford on account of a steady pain in the region of the liver and vomiting. Since that time he has been on rectal alimentation, taking nothing by mouth.

Previous history: Until about six years ago patient had always been well. At that time he began to be troubled with vague pains in the upper abdomen and a sense of soreness about three hours after eating. These pains gradually grew more severe and at times were accompanied by vomiting. Pain at bedtime became almost constant and he frequently ate a cracker or piece of bread at that hour for relief. About five years ago, or one year after the beginning of the pains, he had a severe hematemesis in which he states that he vomited about two quarts of blood. At that time he spent several days in bed, was very weak, and was treated by a physician for "gastralgia." Since that time he has suffered more or less and about every three months he has had an acute attack of severe pain, vomiting, sometimes of blood, but usually without, and melena. During these attacks he always lost considerable weight due to fasting, but has gained just as fast afterwards. Two years ago, during one of these attacks, he began to use

gastric lavage as a daily treatment, but during the last few months this has failed to give him its former relief. During the last such attack previous to the present trouble, one of us (Dr. O'Neill) saw the patient in consultation with Dr. Crawford, made a diagnosis of duodenal ulcer and advised operation, to which the patient refused to submit.

Habits: Drinks beer and smokes in moderation. Has always been a hearty eater, but prefers plain food.

Family history: Negative.

During the present illness, at the time of seizure with the violent pain in the abdomen, being unable to reach Dr. Crawford, he was seen by a substitute who gave him morphine for the pain, and he was not seen by Dr. Crawford until some 40 hours after the onset. We were then called at once and the following are the notes of our examination:

Examination. Patient in dorsal posture with knees drawn up; is pale and appears drowsy. Pulse 110, resp. 30, temp. 101.8°. The sclera has a sub-icteric tinge; tongue dry and coated; chest negative. Abdomen does not appear distended and there is no visible peristalsis. Palpation reveals a diffuse tenderness, accentuated in the right hypochondrium, with a definite rigidity of the right rectus, more pronounced in its upper half. Upon combined palpation and auscultation a distinct "gurgling" can be heard in the pyloric region. W. B. C. 16,400. A diagnosis of ruptured duodenal ulcer was made without hesitation and patient immediately subjected to laparotomy.

Operation: Drs. Courtenay, O'Neill and Lewis. Ether anesthesia. Right rectus incision. The pyloric end of the stomach is concealed by an adherent mass of omentum. Immediately upon its liberation there is an escape of gas, and a hard tumor, about the size of a small apple and densely adherent to surrounding structures, is palpable at the pyloric outlet. Delivery is accompanied by a flow of odorous purulent material, and, on the under surface of the duodenum, extending from the pyloric junction to a point about two inches distal to it, is found a perforation, so large as easily to admit the four fingers of the operator. So great was the induration and thickening of the bowel wall that, when plication had finally been accomplished, the pylorus was almost completely occluded. A posterior gastro-jejunostomy was now made and the abdomen closed with gauze drainage.

Post-operative: The patient was placed in a semi-sitting posture and reacted well. Four hours after operation fluids by mouth were started in very small amounts and he was also given salines per rectum during the first 12 hours. For the next 48 hours his condition improved markedly, and semi-solid food was now given and retained. Drainage was now removed. Bowels moved normally and by the aid of enemata during the days following. A progressive improvement in patient's general condition was evidence of a complete patency and function of the newly-formed channel via the jejunum. On the fifth day the discharge from the wound, which had been bile-stained and small in amount, became more copious and of a sour, fetid odor. A fistulous opening was suspected and the suspicion was confirmed when methylene blue, given by mouth, colored the discharge in about one hour. From now on the man's general condition grew progressively worse owing to his inability to retain nourishment. On the eighth post-operative day his pulse was 120, resp. 26, temp. 99.8°, W. B. C. 11,800, and patient was very pallid and weak. Intervention with a view to closing the fistulous tract was determined upon, and as a preliminary measure a direct transfusion of blood from his 18-year-old daughter was performed. This was readily accomplished by suturing the donor's radial artery to the recipient's median vein, following the technic described by Carrell.³ Circulation was allowed for fifteen minutes, and the immediate result

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was extremely gratifying, as evidenced by the patient's change in color and the immediate improvement in the volume and quality of pulse and the character of respirations. Operation was now proceeded with.

Second operation: Opening through recent incision. Healing good and quite normal. The site of injury is entirely walled off by dense masses of omentum. Upon exposure of the pylorus it is now found almost completely severed from the gut and leaking only from a new perforation just above our former line of suture, which is entirely intact and shows good union throughout. In the duodenum the same is the case, the original perforation being completely closed, but leakage now appearing from a large opening just distal to the former one. Both fresh perforations were closed as before and covered with omentum.

Examination of the gastro-jejunostomy reveals a perfect union and complete patency. There is no gross reaction nor any adhesions here. Abdomen closed with through and through sutures and gauze drainage from original incision. Pulse 140, temp. 98°, resp. 28. The patient rallied slightly, but succumbed in a state of shock six hours after the operation.

Post-mortem: The stomach is slightly dilated but empty. Pylorus and duodenum as previously described. The perforation in the duodenum is found to reach within two inches of the beginning of the jejunum. Under surface of liver covered with fresh adhesions and gall-bladder bound down by more ancient ones. The pancreatic duct is dilated and investigation shows it to be adherent to the gut so as to cause a stricture of the duct. The pancreas itself is enlarged, hard and congested.

Remarks: From the time of the primary exploration we were surprised at the entire absence of fat necrosis in the abdominal tissues. In a case reported by Richter⁴ of perforation about one-half inch from the opening of the duct, this was a pronounced feature. He was also able to produce it experimentally in animals by perforating the duodenum at a similar point and closing the abdomen for from 24 hours until death. We have been able personally to verify this by perforating a dog's duodenum with quite uniform results. The explanation for the absence of fat necrosis in this case may lie in the fact that the pancreatic duct had become occluded by adhesions.

Attention is strongly called to the fact that there was no tearing or cutting through of the sutures used, which were a No. 0 silk threaded on a No. 9 cambric needle; nor was there any apparent seepage, but a firm union. The secondary leakage had come through an extension of the perforative process; also the healing of the gastro-jejunostomy was with a minimum of reaction.

One of us (Dr. Courtenay⁵) has previously shown the decided advantage of this fine suture material and the findings here bear out previous investigations.

The fistula, then, apparently formed as a result of auto-digestion of the bowel wall. Berg⁶ has ardently advised a pyloric occlusion in these cases as a safeguard against fistula, but from a study of this case it would seem that the question is not one of adequate mechanical closure, but rather of a progressive pathologic-chemical tissue destruction, as here the immediate repair of the injury itself afforded an almost total occlusion and, further, the secondary perforation occurred distally as well as proximally to the original lesion.

In a recent contribution Deaver⁷ has forcibly emphasized the value of early surgical intervention in these cases and the extremely bad results in cases of more than 24 hours standing. This con-

dition is in the highest sense a surgical emergency and the time to operate is early. There is perhaps no other site in the abdominal cavity at which the destructive processes are more viciously active, and a delay of hours is so productive of direful consequences as to change what often affords most gratifying results into a battle against almost insurmountable odds.

Bibliography.

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THE VALUE OF HIGH FREQUENCY CURRENT IN TREATING CALCULI IN A DIVERTICULUM.*

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There are two questions involved in this case which I will later on give you particulars of, large calculi in a diverticulum of the urinary bladder.

First—What is a diverticulum?

Second—What is the value of high frequency current on vesical calculi?

Confusion has arisen as to what is a diverticulum and what is a sacculi. They have a pathological resemblance, although etiologically distinct.

Diverticula: (1) They are of congenital origin. (2) All coats of the hollow viscera enter into their formation. (3) They are seldom multiple and are found at any age. (4) They usually attain a large size. The appendix is a representative of the type in a normal subject. Meckel's diverticulum is the most common abnormal diverticulum. Traction diverticula are another class, due to the mechanical drag of a small adhesion.

Saculi differ from diverticula: (1) They are never of congenital origin. (2) They are mostly hernias of the mucous membrane through the muscular coat. (3) They are thin-walled and associated with obstruction of the outlet. (4) They are multiple and are usually limited to advanced life. They are not found in youth. They are found throughout the gastro-intestinal tract, the urinary tract, the gall bladder, and the appendix, or in any of the hollow viscera. All of them may harbor concretions, are liable to attacks of inflammation, and may be of the greatest surgical importance.

Case history: Male, age 56 years. The trouble began twenty years ago with pain, frequency, and straining on passing urine. He was advised to use a catheter, although he passed urine freely. Sometimes he had acute attacks with severe spasms of the bladder. In recent years these spasms became excruciating. The frequency was often every half hour by day, and five or six times by night. He had no control over his urine and wore a rubber urinal always.

Examination, Sept. 25, 1913: Very thin and feeble, with some bed-sores on his back. On palpation felt a lump like a ball close to umbilicus, which one could almost grasp with the fingers at times. He was taking large doses of drugs to relieve the spasms. No enlargement of the prostate, no residual urine, no stricture.

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